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1. Cyclone Michaung - an unusual storm

Introduction

Tropical cyclone Michaung crossed the Andhra Pradesh coast in Bapatla district between the cities of Nellore and Machilipatnam on December 5. The storm, which was centred around 80 km southeast of Nellore and 120 km north-northeast of Chennai, moved northwards along the Andhra Pradesh coast and has brought heavy rain to most of Tamil Nadu, parts of Andhra Pradesh, and southern Odisha.

An unusual cyclone

Due to unfavourable ocean conditions, storms that develop over the North Indian Ocean in December don't usually attain destructive intensities. High-intensity cyclones — packing high speeds and bringing heavy and widespread rain — such as Michaung are not common at this time of the year.

The IMD had initially predicted that Michaung would remain a 'tropical cyclone' (wind speeds of 62 kph to 87 kph) until it crossed the Andhra Pradesh coast. However, the IMD upgraded it to the intensity of a 'severe' storm (wind speeds of 88 kph to 166 kph).

Such intensification of a December cyclone is unique. The above-normal value of the heat index off the southern Andhra Pradesh coast led to the strengthening of Michaung.

Indian tropical storms

Climatologically, about five cyclones develop in the North Indian Ocean basin — comprising the Bay of Bengal and the Arabian Sea — every year. Of these, an average of four cyclones develop over the Bay of Bengal and one over the Arabian Sea. However, Arabian Sea storms often reach higher intensities and carry the potential to cause widespread damage.

The North Indian Ocean basin is most prone to cyclone development during the pre-monsoon (April-June) and post-monsoon (October-December) months. Due to favourable ocean conditions, cyclones that form in May and November usually reach higher intensities than storms that form at other times.



Storm intensification

Tropical cyclones are fueled by ocean heat (in addition to other factors). Ocean temperatures of 26 degrees Celsius or more, prevailing at depths between 50 metres and 100 metres, are conducive for cyclogenesis, which refers to the processes that lead to the development and strengthening of a cyclone.

Warm oceans contribute to a cyclone's rapid intensification while at sea. An oceanographic parameter called the Tropical Cyclone Heat Potential (TCHP) is considered an important factor in cyclone genesis, intensification, and propagation.

The intensification process is highly complex, and is also influenced by a combination of various favourable atmospheric conditions including boundary layers (the fluid layer adjacent to a bounding surface), wind shear (changes in wind direction and/or speed over a vertical or horizontal distance), convection (transfer of heat within a fluid), Rossby waves (which occur in rotating fluids), upper ocean circulation, and air-sea interaction.

Relevance: GS Prelims & Mains Paper I; Geography

Source: The Indian Express

2. Karni Sena chief killed: Who was Sukhdev Singh Gogamedi, and what was the outfit he headed?

Introduction

Sukhdev Singh Gogamedi, president of Shri Rashtriya Rajput Karni Sena (SRRKS), was shot dead in Jaipur by three assailants, one of whom was also killed in retaliatory firing. The incident took place at Gogamedi's home in Jaipur's Shyam Nagar.

Reports have claimed that a member of the Lawrence Bishnoi gang purportedly took responsibility for Gogamedi's killing. Bishnoi is a gangster from Punjab currently lodged in Tihar jail.

Why was the Shri Rashtriya Rajput Karni Sena formed?

SRRKS is a splinter group of the Shri Rajput Karni Sena (SRKS). The Shri Rajput Karni Sena was formed in 2006 by the late Lokendra Singh Kalvi. Gogamedi was once close to Kalvi and was the state president of the Karni Sena, but was expelled from the SRKS by Kalvi in 2015. This was when he floated the SRRKS.

Over the last few years, the SRRKS had gained prominence, often through violent opposition to various issues. It was specially in the news during the protests against the Bollywood movie 'Padmaavat'. It was the SRRKS that assaulted director Sanjay Leela Bhansali in January 2017 during the film's shooting at Jaigarh fort in Jaipur.

More recently, in April this year, they had demanded an increase in EWS quota for general castes from 10 per cent to 14 per cent.

And why was the Shri Rajput Karni Sena formed?

The SRKS was founded following the Rajputs' struggle with their traditional rivals, the Jats, in 2006. That year, Anandpal Singh, a Ravana Rajput and then Rajasthan's most notorious gangster, killed Jivan Ram Godara and Harphool Ram Jat in Didwana, allegedly over control of the illicit liquor business. As Jats protested, they got support from a wide spectrum of political leaders, and the police allegedly detained any Rajput man who could be linked to Anandpal.

To resist the "hounding" of Rajputs, the SRKS was founded on September 23, 2006, with 11 declared aims, including opposing political or social malice against Rajputs and the misrepresentation of history or historical figures, and promoting Rajput unity. The outfit was named after Karni Mata, a goddess revered across Rajasthan, but whose principal seat is at the famous rat temple in Deshnok near Bikaner.

3. Mining for critical minerals: what is the auction process, and why is it important?

Introduction

Twenty blocks of critical minerals are currently on auction for commercial mining by the private sector. The mineral blocks contain lithium ore, which has use in batteries and electric vehicles, and another 10 of the 30 minerals that the government declared as "critical" in July.

The bidding process began on November 29, and bids can be submitted until January 22 next year. The total value of these blocks is estimated at Rs 45,000 crore, subject to further discoveries or revisions in inferred reserves.

This is the first time that rights related to the mining of lithium ore are being auctioned to private parties. Other minerals in the blocks include nickel, copper, molybdenum, and rare earth elements (REEs). All these minerals are utilised in key supply chains for vehicle batteries, energy storage devices, consumer electronics, and vital industrial processes.

Where are these critical mineral blocks, and what rights are being auctioned?

The Notice Inviting Tender (NIT) floated by the Ministry of Mines says the 20 blocks are spread over eight states. There are seven blocks in Tamil Nadu, four in Odisha, three in Bihar, two in Uttar Pradesh, and one each in Gujarat, Jharkhand, Chhattisgarh, and Jammu & Kashmir.

Only four of these 20 blocks are being auctioned for a Mining Licence (ML), which means that once the licence is granted, the licensee can begin mining operations after obtaining the requisite clearances.

Three of these four blocks are in Odisha, and contain deposits of nickel, copper, graphite, and manganese. The fourth block is in Tamil Nadu, and contains deposits of molybdenum.

And what sort of rights are being auctioned for the other 16 blocks?

The remaining 16 blocks are being auctioned for a Composite Licence (CL), which allows the licensee to conduct further geological exploration of the area to ascertain evidence of mineral contents.

Once the licensee collects sufficient information on mineral deposits, they can make an application to the relevant state government to convert their CL to an ML to begin

mining operations pending requisite clearances. The licensee has three to five years to complete the prescribed level of exploration, failing which the licence will be withdrawn.

What are the estimated reserves of key critical minerals in these blocks?

The two blocks of lithium reserves, one each in J&K and Chhattisgarh, are up for auction for a CL.

According to the NIT, the J&K block has an inferred reserve of a 5.9 million tonne (mt) of bauxite column, which contains more than 3,400 tonnes of lithium metal content. This block also contains more than 70,000 tonnes of titanium metal content.

The block in Chhattisgarh contains lithium and REEs, but no drilling has been conducted yet to estimate total reserves.

Nickel ore reserves have been found in three blocks, one each in Bihar, Gujarat, and Odisha. While no drilling has been conducted for the blocks in Bihar and Gujarat, in the Odisha block, the NIT states an inferred value of 2.05 mt of nickel ore, which amounts to 3,908 tonnes of nickel metal content.

This Odisha block is being auctioned for an ML. It is also the only block among the 20 that contains deposits of copper — amounting to 6.09 mt of copper ore and 28,884 tonnes of copper metal content.

How does India currently get its supplies of these minerals?

Recently, India imported 2,145 tonnes of lithium carbonate and lithium oxide at a total cost of Rs 732 crore. Lithium carbonate contains up to 19 per cent lithium. Lithium oxide, which is usually converted to lithium hydroxide, contains 29 per cent lithium.

India also imported 32,000 tonnes of unwrought nickel at a cost of Rs 6,549 crore, and 1.2 million tonnes of copper ore at a cost of Rs 27,374 crore, in 2022-23.

India is 100 per cent reliant on imports for its lithium and nickel demand. For copper, this figure is 93 per cent.

What will happen after the ongoing round of auctions is over?

The bidding process began after the government declared 30 minerals as “critical”, and amended a key law to allow for the mining of three critical minerals, lithium, niobium, and REEs, earlier this year. To attract bidders, the government also specified new royalty rates for critical minerals, matching global benchmarks.

The bid for each block will be awarded on the highest percentage of mineral dispatch value quoted by the bidder. After the ongoing auction is over, the process to auction

a second tranche of critical mineral blocks is expected to begin. It is currently unclear if this second tranche would include new lithium reserves found in Rajasthan and Jharkhand.

Relevance: GS Prelims & Mains Paper III; Economics

Source: Indian Express

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